

EXHIBIT 5

NEWTON'S TELECOM DICTIONARY

The Official Dictionary of
Telecommunications & the Internet

**16th Updated, Expanded and Much
Improved Edition**

NEWTON'S TELECOM DICTIONARY

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ing of multiple wavelengths of light. WDM systems support the multiplexing of as many as four wavelengths; commercially available DWDM systems support from 8 to 40 wavelengths. The capacity is steadily increasing, both by ever-expanding channel counts and faster supported TDM rates of the individual wavelengths. The top numbers are expected to continue to increase for the next few years, at least. Each wavelength operates as though it were a separate light pipe, with each currently supporting as much as OC-192 transmission (9.953 Gbps). Generally, existing systems trade-off channel count against maximum supported rate: the current maximum channel count of 40 (for the present — we are writing this in December, 1998) is limited to OC-48 (almost 100 Gbps net throughput). Systems which support higher signal rate (i.e., OC-192) support fewer than half as many channels, at most. At OC-192, a 40-channel system would yield an incredible 400 Gbps, rounded up. While such a system is not yet available, it may be little more than a year away. Within the next 2-3 years it is reasonable to expect to see systems supporting on the order of 100 wavelengths of OC-192 each, providing almost 1 Terabit per second transport! See WDM (Wavelength Division Multiplexing) for much more detailed explanation.

Dwell Time The period of time that a satellite is over the desired area of coverage. The term has commercial significance in LEO (Low Earth Orbiting) and MEO (Middle Earth Orbiting) satellite systems. In such systems, the individual satellites in a constellation travel in elliptical orbits, rather than in traditional geosynchronous orbits. See LEO and MEO.

DWI Data Warehousing Institute. A Special Interest Group dedicated to "helping organizations increase their understanding and use of business intelligence by educating decision makers and I/S professionals on the proper deployment of data warehousing strategies and technologies." DWI has over 3,000 members. www.dw-institute.com

DWS Dialable Wideband Service.

DX Signaling A form of DC (direct current) signaling in which the differences in voltage on two pairs of a four-wire trunk indicates the supervision information, i.e. the call's beginning, its end, etc. See Duplex Signaling.

DXC Digital Cross Connect. See DCS.

DXCC Digital cross connect control.

DXCS Digital cross connect system.

DXI Data eXchange Interface. A specification developed by the SMDS (Switched Megabit (or Multi-megabit) Data Services) Interest Group to define the interaction between internetworking devices and CSUs/DSUs that are transmitting over an SMDS access line. SMDS is a way for a corporate network to dial up switched data services as fast as 45 megabits per second. The ATM Forum defines DXI as "a variable length frame-based ATM interface between a DTE and a special ATM CSU/DSU. The ATM CSU/DSU converts between the variable-length DXI frames and the fixed-length ATM cells."

Dye Sublimation a spectacular printing process where exactly measured temperatures control the amount of ink transferred from colored ribbons to paper. Under high temperature and pressures, the ink is not melted, but is transformed directly to gas, which hardens on the paper after passing through a porous coating. Dye sub printers create very nearly continuous tones, making them great for natural images. Because the gas makes "fuzzy" dots, dye sub is not recommended for sharp-edged "computer-y" graphics or type. But it does turn out gorgeous photo-like images.

Dynamic In English, dynamic means that things are changing. In telecomese, it tends to mean that our equipment —

hardware and/or software — can respond instantly to changes as they occur. For example, dynamic routing in the call center world means that when a machine can switch the incoming calls from moment to moment. We may want to this because we want calls from the east to go to our call center in the east. Our eastern call center may presently be busy. So we may want to flip the calls over

Dynamic Address Mapping Service A service which provides a lookup function between text-based strings and IP addresses and/or telephone numbers, in which the result of the lookup can change relatively quickly over time (hence the use of the word "dynamic.")

Dynamic Answer This is a term typically used in Automatic Call Distributors. The ability to dynamically assign the number of ring cycles (interrupt, more or less) to the queue period when agents are unavailable. The implication of being able to assign this number allows return supervision to the calling in person to be delayed and thus not allow billing on 800 INWATS lines to begin. This is a money saving feature. But it can cost you some customers if they get bored waiting for your phones to pick up.

Dynamic Backup A backup made while the database is active.

Dynamic Bandwidth Allocation The capability of subdividing large, high-capacity network transmission resources among multiple applications almost instantaneously, and providing each application with only that share of the bandwidth that the application needs at that moment. Dynamic bandwidth allocation is a feature available on certain high-end T-1 multiplexers that allows the total bit rate of the multiplexer's circuits to exceed the bandwidth of the network trunk. This works because the multiplexer only assigns channels on the network trunk to circuits that are transmitting.

Dynamic Beam Focusing When you have a curved cathode ray tube, the distance between the gun which shoots the electrons and all the parts of the screen are equal. When you have a flat screen, the distance varies slightly. Some beams have to travel further. When some have to travel not so far, Dynamic beam focusing, a term I first heard used by NEC, focuses each electron to the precise distance it must travel, thus ensuring edge-to-edge clarity on the screen.

Dynamic Capacity Allocation The process of determining and changing the amount of shared communications capacity assigned to nodes in the network based on current need.

Dynamic Configuration Registry A part of Chicago (Windows 4.0) which contains a list of all the various hardware bits and pieces that make up your computer. The dynamic configuration registry is a vital element of what Microsoft calls "Plug and Play," which is the ability to remove and add bits and pieces of hardware while the machine is running and have the machine automatically recognize those hardwares and alert applications accordingly.

Dynamic Data Exchange DDE. A form of InterProcess Communication (IPC) in Microsoft Windows and OS/2. When two or more programs that support DDE are running simultaneously, they can exchange information, data and commands. In Windows 3.xx this capability is enhanced with Object Linking and Embedding (OLE). See OLE.

Dynamic Host Configuration Protocol DHCP. A protocol for automatic TCP/IP configuration that provides static and dynamic address allocation and management. See DHCP for a longer explanation.

Dynamic HTML Dynamic HTML combines HTML, scripts and style sheets to bring animation to the Web. With Dynamic

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rate, Single connector Drive designed to plug into systems with 80 pin back plane. Thus no controller Card and no Cable.

SCTE Society of Cable Telecommunications Engineers, Inc. A not-for-profit professional organization organized in 1969 to promote the sharing of operational and technical knowledge in the field of cable TV and broadband communications.

STP 1. Screened Twisted Pair. A type of Shielded Twisted Pair (STP) cable which employs a braided screen shield to protect the signal-carrying conductors from EMI (ElectroMagnetic Interference). See also FTP and UTP.

2. Simple Computer Telephony Protocol. SCTP is an Internet protocol authored by Brian McConnell (PhoneZone.Com) and Paul Davidson (Nortel). The protocol, modeled after other Internet application protocols (such as HTTP (worldwide web), SMTP (email), etc), creates a simple, cross-platform interface for building computer telephony applications. Unlike APIs such as TAPI and TSAPI, SCTP can be implemented on any machine which is capable of talking to TCP/IP networks. APIs, on the other hand, are operating system specific. The protocol is primarily intended for use in call control and system administration software. It is not used to create interactive voice response applications. Several vendors, such as Nexpath, a PC PBX manufacturer, have used the protocol to create cross-platform Java CTI applets which will run on virtually any operating system. SCTP is public domain, meaning the specification is public, and that anybody can use the protocol freely. www.phonezone.com/sctp

STP RJ-45 Plug These are used to terminate four pair STP patch cords. They have metal areas to connect the cable's foil shield with the equipment that it is plugged into.

SCVF Single Channel Voice Frequency.

SCWID Spontaneous Call Waiting Display.

SCxbus An SCSA term. The standard SCSA bus for communication between nodes. The SCxbus features the same architecture as the SCbus. See SCxbus Adapter.

SCxbus Adapter Inter-box expansion adapter for the SCbus.

SD Starting Delimiter

SDE 1. Synchronization Distribution Expander.

2. Secure Data Exchange as defined by the IEEE 802.10 security committee.

SDF Sub Distribution Frame. Intermediate cross connect points, usually located in wiring or utility closets. A trunk cable or LAN backbone is run from each SDF to the MDF (Main Distribution Frame).

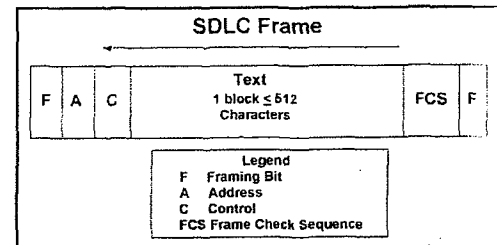
SDH Synchronous Digital Hierarchy. A set of standard fiber-optic-based serial standards planned for use with Sonet and ATM in Europe. Some of the SDH and SONET standards are identical. Standardized by the ITU. See SONET for a much fuller explanation.

SDK Software Development Kit.

SDL 1. Specification and Description Language. A language defined in ITU-T Z.100 for telecommunication.

2. Signaling Data Link.

SDLC Synchronous Data Link Control. A bit-oriented synchronous communications protocol developed by IBM, SDLC is at the core of IBM's SNA (System Network Architecture). Intended for high-speed data transfer between IBM devices of significance (read mainframes), SDLC forms data into packets known as frames, with as many as 128 frames being transmitted sequentially in a given data transfer. Each frame comprises a header, text and trailer. The header consists of Framing bits (F) indicating the beginning of the frame, Address information (A), and various Control data (C). The



data payload, referred to as Text, consists of as many as 7 blocks of data, each of as many as 512 characters. The trailer comprises a Frame Check Sequence (FCS) for error detection and correction, and a set of Framing bits (F) indicating the end of the frame. SDLC is a protocol which supports device communications generally conducted over high-speed, dedicated private line, digital circuits. SDLC can operate in either point-to-point or multipoint network configurations. See also HDLC and IBM. Contrast with Binary Synchronous Communications.

SDLC-To-Token-Ring LLC Transformation A technique to integrate SDLC link-attached SNA devices into a LAN/WAN internet. A modified remote polling process is used to make the link-attached devices appear to be LAN-attached.

SDM 1. Subrate Data Multiplexing. A European term. In North America, it's called SRDM.

2. DMS SuperNode Data Manager.

SDMA Station Detail Message Accounting. See Call Accounting.

SDMF Single Data Message Format. See Caller ID Message Format.

SDN Software Defined Network. See SoftwareDefined Network, SDN Serving Office, Virtual Network, VPN and the Appendix.

SDN Serving Office One of many AT&T-supplied switching nodes in an SDN network. See also Software Defined Network and the Appendix.

SDR Session Detail Record. Cisco's term for CDR (Call Detail Record). Refers to detail records (generated by routers) that are captured and processed by Telco Research's Enterprise Accounting system. Similar to PBX CDR that is captured and processed by a call accounting system.

SDRAM Synchronized Dynamic Random Access Memory. An emerging replacement for DRAM. SDRAM's memory access cycles are synchronized with the CPU clock in order to eliminate wait time associated with memory fetches between RAM and the CPU. See also DRAM and RAM.

SDRM Sub-rate Data Multiplexing. Refers to a service where a DSO (64 Kbps) channel may contain one 56 Kbps signal, five 9.6 Kbps signals, ten 4.8 Kbps signals or twenty 2.4 Kbps signals. Although speeds may be mixed, the highest speed determines the number of signals supported.

SDP 1. Session Description Protocol. SDP conference descriptors are stored in the ILS Dynamic Directory Conference Server, part of Active Directory in Windows NT 5.0. See TAPI 3.0 for a full description.

2. Service Delivery Point. Ed Ward of Belair, MD, writes "I am new to the formal telecommunications world. Although I have worked with circuits / modems / routers etc, up until now it was an ancillary duty. I am a government employee now working full time as a telecommunications specialist. Two of our main contractors are AT&T and SPRINT. Here is one term we

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SYSREQ System request; the seldom used key used to get attention from another computer.

System An organized assembly of equipment, personnel, procedures and other facilities designed to perform a specific function or set of functions.

System Administrator The person or persons responsible for the administrative and operational functions of a computer and a telecom system that are independent of any particular application. The System Administrator is likely to be a person with the best overview of all the applications. The System Administrator advises application designers about the data that already exists on the various services, makes recommendations about standardizing data definitions across applications, and so on.

System Build This is the original manufacturer system building that occurs when the order is placed by the buyer with the vendor. The basic configuration is set up to reflect the users needs at that point in time. Thereafter, if any changes occur to reflect changes in the operating environment, the manufacturer must reconfigure the system to reflect this change. There is usually a reprogramming charge and a delay associated with the change.

System Clock The clock designated as the reference for all clocking in a network of electronic devices such as a multiplexer or transmission facilities management system.

System Common Equipment The equipment on a premises that provides functions common to terminal devices such as telephones, data terminals, integrated work station terminals, and personal computers. Typically, the system common equipment is the PBX switch, data packet switch, or central host computer. Often called common equipment.

System Connect The method by which connection is physically made to the cost computer or local area network.

System Coordinator This is the title assigned to the person responsible for administration programming and the training of workers on your phone system.

System Disk A disk that has been formatted as a system disk. MS-DOS system disks have two hidden files and the COMMAND.COM file. You can start the computer using a system disk.

System Fault Tolerance SFT. The ability of computer to work fully regardless of component failures.

System Feature A telephone switch feature that is typically available all the users.

System Gain The amount of free space path loss that a radio can overcome by a combination of enhancing transmitted power and improving receiver sensitivity.

System Message Messages that are not associated with a mailbox.

System Redundancy The duplication of system components to protect against failure. For protection against failure, install redundant cabling, power supplies, disk storage, gateways, routers, network boards, printers, switches and other mission-critical network components.

System Reload A process allowing stored data to be written from a tape into the system memory. Picture: your telephone system goes dead. For whatever reason it loses all memory of its generic programming and your specific programming (whose extension gets what, etc.). You have to quickly grab the backup (hopefully you have it on tape or magnetic disk) and load it back into your telephone system's memory. This is called system reload. Sometimes it's done automatically. Sometimes you have to do it manually.

System Segment A conceptual subset of a system, usu-

ally referring to one which can be functionally replaced without damaging the capability of the system.

System Service Provider An SCSSA definition. An entity that provides system wide services, such as session management and security, and the allocation and tracking of resources and groups.

System Side Defines all cabling and connectors from the host computer or local area network to the cross connect field at the distribution frame.

System Speed Dial Simplified ways of dialing. You do them by dialing several digits. System speed dial numbers can be used by everyone on the phone system — whether they are on an electronic phone or just a simply single line phone.

System Test This definition courtesy Steve Gladstone, author, "Testing Computer Telephony Systems": System test is the phase of the product life cycle that examines the entire system as a "whole" to assure it is ready to go to a true alpha or beta test. System testing is also more oriented to inter system functions as opposed to earlier phases. To pass a system test, all features and functions are expected to work correctly (function to specification) in all areas of the system — features, administration, maintenance, billing, etc. Additionally, the system must function as an "architectural whole," including all hardware and software components. Representative databases must be loaded to simulate site applications. Full load and stress testing is performed. It is in this phase that the bulk of system level testing will take place. System testing has a major focus on external load and other stimuli.

System V Interface Definition SVID. A UNIX application-to-system software interface developed and supported by AT&T. The interface is similar to POSIX.

Systems Analysis Analyzing an organization's activities to figure the best way of applying computer systems to its organization.

Systems Analyst A person who performs systems analysis and who follows through with methods, techniques and programs to meet the need.

Systems Integrator A systems integrator is a company that specializes in planning, coordinating, scheduling, testing, improving and sometimes maintaining a computing operation (sometimes companywide, sometimes just locally). In the old days, this was done almost exclusively by the International Business Machines Corporation. Somewhere along, companies discovered they could get more flexibility and computing power at a lower cost by shopping around. Today, hundreds of companies contribute various components — hardware, software, wiring, communications and so on — to a company's computer operation. But the added flexibility can bring stunning complexity. Systems integrators try to bring order to the disparate suppliers.

Systems Integration Interface SII. As used in the definition of the proposed multivendor integration architecture sponsored by Nippon Telegraph and Telephone (NTT) of Japan, SII specifies any set of standardized services used to connect computer based-systems.

Systems Network Architecture SNA. IBM's successful computer network architecture. At one stage the most successful computer network architecture in the world. In the days of mainframe computers, it was as successful in the computer networking world as AT&T's telephone network design was in telecommunications. The best explanation we've ever read of SNA is in James Harry Green's Dow Jones-Irwin Handbook of Telecommunications. Here is an excerpt: "SNA is a tree-structured architecture, with a mainframe host

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computer acting as the network control center. The bound-
aries described by the host computer, front-end processors,
cluster controllers and terminals are referred to as the net-
work's domain. Unlike the switched telephone network that
establishes physical paths between terminals for the duration
of a session, SNA establishes a logical path between network
nodes, and it routes each message with addressing informa-
tion contained in the protocol. The network is therefore
incompatible with any but approved protocols. SNA uses the
SDLC data link protocol exclusively. Devices using asynchro-
nous or binary synchronous can access SNA only through
protocol converters...SNA works in seven layers roughly anal-
ogous to ISO's seven level OSI model. Unlike OSI, however,
SNA is fully defined at each level. SNA was first announced in
1974 and is the basis for much of the OSI model, but it differs
from OSI in several significant respects." For more on these
differences, see page 96 in Green's Handbook.

The following is a description we received from IBM's PR
department: "What is SNA?" In general, SNA is the descrip-
tion of the rules that enable IBM's customers to transmit and
receive information through their computer networks. SNA
may also be viewed as three distinct but related entities: a
specification, a plan for structuring a network and a set of
products. First, SNA is a specification governing the design of
IBM products that are to communicate with one another in a
network. It is called an architecture because it specifies the
operating relationships of those products as part of system.
Second, SNA provides a coherent structure that enables users
to establish and manage their networks and, in response to
new requirements and technologies, to change or expand
them. Third, SNA may be viewed as a set of products: combi-
nations of hardware and programming designed in accor-
dance with the specification of SNA. In addition to a large
number of computer terminals for both specific industries and
general applications, IBM's SNA product line includes host
processors, communication controllers, and adapters,
modems and data encryption units. The SNA product line also
includes a variety of programs and programming subsystems.
Telecommunications access methods, network management
programs, distributed applications programming and the net-
work control program are examples.

Systems Network Interconnection SNI. A service
defined by IBM that allows for the interconnection of sepa-
rately defined and controlled Systems Network Architecture
(SNA) networks. See Systems Network Architecture.

Systems Services Control Point SSCP. An IBM Corp.
Systems Network Architecture (SNA) term for the software
that manages the available connection services to be used by
the Network Control Program (NCP). There is only one SSCP
in an SNA network domain, and the software normally resides
in the host processor, which is a member of the IBM
System/370 mainframe family.

Systems Software A type of program used to enhance the
operating systems and the computer systems they support.

Systemview The network management program that pur-
ports to let UNIX-based computers be managed along with
other IBM systems.

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processes of network configuration (design) and reconfiguration are greatly simplified as compared to a leased-line network. Provisioning time is also greatly reduced. The greatest disadvantage of VPNs is that all calls are priced based on an algorithm much like that of a voice call. In other words, costs are calculated by duration and time of day, with prime time calls being priced at a premium. Day-of-week and other special discounts also apply. Some carriers also consider distance in the pricing of VPN calls. Purely from a cost standpoint, leased-lines are preferred for networking large sites with intensive communications needs. Leased line networks also can support not only data and video transmission, but also voice, thereby offering the advantage of integration of all communications needs over a single network. Access to a VPN POP (Point of Presence) — the place the long distance company beings the VPN it's leasing you — can be gained directly from the IXC (Inter-exchange Carrier), from a CAP (Competitive Access Provider), or from the LEC (Local Exchange Carrier). Appropriate access technologies include leased lines, Switched 56/64, and ISDN. See also Switched 56 and Private Line.

2. A means of augmenting a shared network on a secure basis through encryption or tunneling. Such a shared network could be an IP (Internet Protocol) network such as X.25 or the Internet, or an Intranet, or a frame relay network. Tunneling involves encapsulation of that encrypted data inside IP packets or frame relay frames. Additional security is provided through firewalls at the user sites and, perhaps, in the carrier network. VPNs also allow prioritize user data, in order to enhance performance. Effectively, VPNs are intended to be high performance extranets.

3. In a direct mail catalog, which Data Comm Warehouse (www.warehouse.com) sent out in October, 1998, they posed the question, "What a Virtual Private Network can do for you?" And they answered it thusly: A VPN is the creation of a highly secure, point-to-point connection over the Public Internet. Users make local connections to the Internet Service Provider (ISP), saving on long distance or expensive distance-based digital services, then data is transmitted over the Internet. Your data is encrypted using a key known only to the sender and the receiver, so no one can read your sensitive information. And your router can support both multiple VPN tunnels and normal open Internet access at the same time. A VPN gives you two uses for the connection to your Internet Service Provider — tapping the information potential of the Net and transmitting secure business information. See also Encryption, Extranet, Firewall, Internet and Tunneling.

Virtual Private Office I found this definition of Virtual Private Office in the September 13, 1997 issue of the Economist, one of my favorite magazines. They had a roundup of telecommunications. Here's how they started their roundup: In Anderson Consulting's smart new offices in Wellesley, just outside Boston, Mark Greenberg is entitled as a senior partner to three filing-cabinet drawers of storage space. In one, he keeps a bubble-wrapped package, containing the sort of personal mementoes family photographs, shields and so on with which businessmen like to decorate their offices, together with a diagram to show how they should be arranged. On the rare days when Mr Greenberg is not visiting a client or jetting around the world, he reserves an office. When he arrives, his treasures are neatly laid out on the desk for him to make him feel at home.

But this is, in effect, a virtual private office, his just for the day.

Struck by the waste involved in maintaining expensive permanent offices for people with itinerant lives, the partners in the world's largest management consultancy have created something that feels like a cross between a hotel and a luxurious club. The Wellesley office is staffed by the cream of Boston's hotels: people who understand the business of providing services for important and self-important people. The reception desk looks like a hotel foyer; each floor has lots of little "huddle rooms" with comfortable armchairs, as well as brainstorming rooms with less comfortable ones; and there are open spaces for coffee and conversation with colleagues.

Virtual Reality VR. The publisher of Virtual Reality Report says, "Virtual reality is a way of enabling people to participate directly in real-time, 3-D environments generated by computers." Virtual reality involves the user's immersion in and interaction with a graphic screen/s. Using 3-D goggles and sensor-laden gloves, people "enter" computer-generated environments and interact with the images displayed there. Says Business Week, "Imagine the difference between viewing fish swimming in an aquarium and donning scuba gear to swim around them. That's the sensory leap between regular computer graphics and virtual reality. There are three kinds of VR (Virtual Reality) immersion. First, the toe in the water experience of beginners who stand outside the imaginary world and communicate by computer with characters inside it. Next, wading up to the hips, are the "through the window" users, who use a "flying mouse" to project themselves into the virtual, or artificial, world. Then there are the hold-the-nose plungers: "first persona interaction within the computer-generated world via the use of head-mounted stereoscopic display, gloves, bodysuits and audio systems providing binocular sound. The trick with virtual reality is not only to simulate another world but to interact with it — pouring in data affecting its plots, changing its characters and introducing real-world unpredictability into this "mirror world." Once virtual reality was called artificial reality. But artificial means "fake," while virtual means "almost." The father of virtual reality is Joran Lanier. A term close to virtual reality is telepresence. See Telepresence.

Virtual Route Virtual circuit in IBM's SNA. See Systems Network Architecture.

Virtual Route Pacing Control A congestion control at the path control level. See Systems Network Architecture.

Virtual Storage Storage space that may be viewed as addressable main storage to a computer user, but is actually auxiliary storage (usually peripheral mass storage) mapped into real addresses. The amount of virtual storage is limited by the addressing scheme of the computer.

Virtual Telecommunication Access Method VTAM (Pronounced "Vee-Tam.") A program component in an IBM computer which handles some of the communications processing tasks for an application program. VTAM also provides resource sharing, a technique for efficiently using a network to reduce transmission costs.

Virtual Terminal VT. A universal terminal. The ISO virtual terminal (VT) protocol is designed to describe the operation of a so-called universal terminal so any terminal can talk with any host computer.

Virtual Terminal Protocol VTP. Virtual Terminal Protocol enables computers to communicate with various types of terminals by interpreting and translating the instructions for both the computer and the terminal.

Virtual Tributary VT. A structure designed for transport and switching of sub-DS3 payloads. A unit of sub-Sonet